

FACT SHEET

as required by LAC 33:IX.3111 for major LPDES facilities, for draft Louisiana Pollutant Discharge Elimination System Permit No. LA0032221; AI 8994; PER20080002 to discharge to waters of the State of Louisiana as per LAC 33:IX.2311.

The permitting authority for the Louisiana Pollutant Discharge Elimination System (LPDES) is:

Louisiana Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

- I. THE APPLICANT IS:** United States Department of the Army
South Fort Polk Wastewater Treatment Plant
6661 Warrior Trail, Bldg. 350, Suite 230
Fort Polk, LA 71459-5339
- II. PREPARED BY:** Todd Franklin
- DATE PREPARED:** November 24, 2008
- III. PERMIT ACTION:** reissue LPDES permit LA0032221, AI 8994; PER20080002
- LPDES application received: June 4, 2008
- EPA has not retained enforcement authority.
- Previous LPDES permit effective: December 1, 2003
Previous LPDES permit expired: January 31, 2007

IV. FACILITY INFORMATION:

- A. The application is for the discharge of treated sanitary wastewater from a federally owned treatment works serving the South Fort Family Housing of the Joint Readiness Training Center and Fort Polk.
- B. The permit application does indicate the receipt of industrial wastewater. The industrial discharger listed is:

Name of Discharger
U.S. Army*

Flow
up to 40,000 GPD

*Various activities related to an Army Post, including but not limited to water from soldier's training activities including showers, meal preparation, drinking water purification units, water from oil water separators, water from all other activities related to military activities and training operations.

- C. The facility is located on Georgia Avenue in Fort Polk, Vernon Parish.

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- D. The treatment facility consists of three (3) treatment trains, Plant A/B and Plant C. The influent enters either Plant A/B or Plant C. In both plants, wastewater passes through a barminutor, grit chamber, and grease removal systems. In Plant A/B, wastewater is split between two (2) circular primary clarifiers. In Plant C, wastewater flows into one circular primary clarifier. Effluent from the three (3) clarifiers flow in parallel to three (3) trickling filters and then to three (3) secondary clarifiers. Effluent from the Plants A/B and Plant C secondary clarifiers are combined in an equalization basin where chlorine disinfection occurs.

The wastewater is then pumped from the equalization basin via a three-mile long forced main to a central distribution box (the discharge from the central distribution box will be Outfall 005). From the distribution box, the treated wastewater is diverted to one of the five sets of three facultative ponds. Pond set 1 discharges to overland flow dispersion system Outfall 001. Pond set 2 discharges to overland flow dispersion system Outfall 002. Pond set 3 discharges to overland flow dispersion system Outfall 003. Pond set 4 and 5 discharges to overland flow dispersion system Outfall 004. Under normal conditions, the effluent is discharged into the four baygalls on a rotating basis. The terms baygall is defined as the headwater of a stream surrounded by pine forest where an impervious clay layer causes the groundwater to percolate to the surface, producing a perched water table and stream conditions conducive to the growth of sweetbay, redbay, and gallberry. Effluent is discharged into the baygalls from a pipeline with small discharge ports spaced at 30-inch intervals along the pipeline. The water filters down through a layer of fine sand, then laterally along the surface of an underlying impervious clay layer, and finally emerging at the base of the slope in a series of rivulets. Sample collection for Outfalls 001 – 004 will occur in the primary channel of each baygall immediately downstream from the point where the effluent emerges from the sandy soil.

Sludge is treated in a multi-step aerobic digester process and dried on sand drying beds. Sludge is disposed at an approved landfill.

- E. Outfall 001 (northern most outfall – discharge into the northern most baygall from Pond Set 1)

Discharge Location: Latitude 31° 3' 43.6" North
Longitude 93° 10' 39.3" West

Outfall 002 (southeast of Outfall 001 – discharge into baygall southeast of Outfall 001 from Pond Set 2)

Discharge Location: Latitude 31° 3' 16.9" North
Longitude 93° 10' 26.6" West

Outfall 003 (southeast of Outfall 002 – discharge into baygall southeast of Outfall 002 from Pond Set 3)

Discharge Location: Latitude 31° 2' 42.2" North
Longitude 93° 9' 54.4" West

Outfall 004 (southwest of Outfall 003 – discharge into baygall southwest of Outfall 003 from Pond Sets 4 and 5)

Discharge Location: Latitude 31° 2' 22.2" North
Longitude 93° 10' 32.9" West

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Outfall 005 (discharge from the secondary treatment plant, prior to entering the ponds at the Central Distribution box)

Discharge Location: Latitude 31° 3' 4.9" North
Longitude 93° 10' 54.7" West

Description: treated sanitary wastewater

Design Capacity: 3.8 MGD

Type of Flow Measurement which the facility is currently using:

Totalizing turbine flow meter

V. RECEIVING WATERS:

The discharge is into Drakes Creek in Subsegment 030501 of the Calcasieu River Basin, defined at LAC 33:IX.1123.Table 3 as *Whiskey Chitto Creek-from headwaters to southern boundary of Fort Polk Military Reservation*. Subsegment 030501 is listed on the 303(d) list of impaired waterbodies.

The critical low flow (7Q10) of Drakes Creek is 0.177 cfs.

The hardness value is 49 mg/l and the fifteenth percentile value for TSS is 11.25 mg/l.

The designated uses and degree of support for Subsegment 030501 of the Calcasieu River Basin are as indicated in the table below^{1/}:

Degree of Support of Each Use						
Primary Contact Recreation	Secondary Contact Recreation	Propagation of Fish & Wildlife	Outstanding Natural Resource Water	Drinking Water Supply	Shell fish Propagation	Agriculture
Not Supported	Full	Full	N/A	N/A	N/A	N/A

^{1/} The designated uses and degree of support for Subsegment 030501 of the Calcasieu River Basin are as indicated in LAC 33:IX.1123.C.3, Table (3) and the 2006 Water Quality Management Plan, Water Quality Inventory Integrated Report, Appendix A, respectively.

VI. ENDANGERED SPECIES:

The receiving waterbody, Subsegment 030501 of the Calcasieu River Basin, is not listed in Section II.2 of the Implementation Strategy as requiring consultation with the U. S. Fish and Wildlife Service (FWS). This strategy was submitted with a letter dated October 24, 2007, from Boggs (FWS) to Brown (LDEQ). Therefore, in accordance with the Memorandum of Understanding between the LDEQ and the FWS, no further informal (Section 7, Endangered Species Act) consultation is required. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat. It was determined that the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat.

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VII. HISTORIC SITES:

The discharge is from an existing facility location, which does not include an expansion beyond the existing perimeter. Therefore, there should be no potential effect to sites or properties on or eligible for listing on the National Register of Historic Places, and in accordance with the 'Memorandum of Understanding for the Protection of Historic Properties in Louisiana Regarding LPDES Permits' no consultation with the Louisiana State Historic Preservation Officer is required.

VIII. PUBLIC NOTICE:

Upon publication of the public notice, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit modification and may request a public hearing to clarify issues involved in the permit decision at this Office's address on the first page of the statement of basis. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

Public notice published in:

Local newspaper of general circulation

Office of Environmental Services Public Notice Mailing List

For additional information, contact:

Mr. Todd Franklin
Permits Division
Department of Environmental Quality
Office of Environmental Services
P. O. Box 4313
Baton Rouge, Louisiana 70821-4313

IX. PROPOSED PERMIT LIMITS:

IMPAIRMENTS

Subsegment 030501, *Whiskey Chitto Creek-from headwaters to southern boundary of Fort Polk Military Reservation*, is listed on LDEQ's Final 2006 303(d) List as impaired for fecal coliform. To date no TMDLs have been completed for this waterbody. A reopener clause will be established in the permit to allow for the requirement of more stringent effluent limitations and requirements as imposed by a TMDL.

Fecal Coliform

To protect against the discharge of fecal coliform bacteria at levels which could cause the receiving waterbody to exceed the state water quality criteria for bacteria, effluent limitations for fecal coliform have been established in the permit.

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PRE-APPLICATION TREATMENT

It is the intent of this Office to protect in-stream conditions during times of critical or low flow. As such, LAC 33:IX.2311.A.1, requires permits for the discharge of pollutants from any point source into waters of the state. Since the baygalls are not included as waters of the state, effluent limitations and monitoring requirements will not be required for discharge to the baygalls. However, every attempt should be made to meet limitations equivalent to secondary treatment as established by LAC 33:IX.5905.A and B and LAC 33:IX.711.D.2 prior to discharge into the baygalls.

PROPOSED PERMIT LIMITS – OUTFALLS 001, 002, 003, 004, and 005**Post Application Effluent Limitations**

Overland flow systems provide advanced tertiary treatment to secondary treated wastewater. The wastewater is treated in the saturated top layer of the soil and by bacteria and algae attached to the vegetation. Wastewater is treated as it passes through the soil by filtration, adsorption, ion exchange, precipitation, microbial action, and plant uptake. In addition, microbes attached to the vegetation to extract nutrients. Overland flow systems provide significant reductions in BOD and TSS. Nitrogen is removed through nitrification/denitrification and crop uptake. Phosphorus removal is limited due to the minimum amount of percolation, but is held in the soil and serves to enrich the soil. Some wastewater is lost through evaporation and transpiration. Very little wastewater is passed onto the groundwater, due to the use of underlying impermeable soils. The remaining wastewater is collected at the bottom of the slope and discharged into nearby waters of the state. (*Process Design Manual for Land Treatment of Municipal Wastewater*, USEPA, US Army Corps of Engineers, and US Department of Agriculture, 1977)

TOTAL RESIDUAL CHLORINE

As per LAC 33:IX.2707.L.2.a.ii, availability of information which was not available at the time of previous permit issuance and will justify the application of less stringent effluent limitations in the proposed permit constitutes an exception to LAC 33:IX.2707.L.1, which states when a permit is renewed or reissued standards or conditions must be at least as stringent as the final limitations, standards, or conditions in the previous permit. In the previous permit, this treatment facility was required to meet a maximum limitation of less than 0.1mg/l TRC. A review of the DMRs from the monitoring period from July 2006 through June 2008 revealed no effluent data for TRC above 0.1 mg/l. Since the TRC in the effluent has consistently been below 0.1 mg/l, which is considered "No Measurable", the TRC effluent limitation has been removed from the permit.

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Final Effluent Limits:**Outfall 005 (Central Distribution Box)**

Final limits shall become effective on the effective date of the permit and expire on the expiration date of the permit.

1) Fecal Coliform

The discharge from this facility is into a water body which has a designated use of Primary Contact Recreation. According to LAC 33:IX.1113.C.5.a, the fecal coliform standards for this water body are 200/100 ml and 400/100 ml. Therefore, the limits of 200/100 ml (Monthly Average) and 400/100 ml (Daily Maximum) are proposed as Fecal Coliform limits in the permit. These limits are being proposed through Best Professional Judgement in order to ensure that the water body standards are not exceeded, and due to the fact that existing facilities have demonstrated an ability to comply with these limitations using present available technology.

2) Biomonitoring Language

In accordance with EPA's Region 6 Post-Third Round Toxics Strategy, permits issued to treatment works treating domestic wastewater with a flow (design or expected) greater than or equal to 1 MGD shall require biomonitoring at some frequency for the life of the permit or where available data show reasonable potential to cause lethality, the permit shall require a whole effluent toxicity (WET) limit (*Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards*, September 27, 2001 VERSION 4).

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates the effects of synergism of the effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. LAC 33:IX.1121.B.3. provides for the use of biomonitoring to monitor the effluent for protection of State waters. The biomonitoring procedures stipulated as a condition of this permit are as follows:

The permittee shall submit the results of any biomonitoring testings performed in accordance with the LPDES Permit No. LA0032221, **Biomonitoring Section** for the organisms indicated below.

TOXICITY TESTS**FREQUENCY**

Chronic static renewal 7-day survival & reproduction test
using Ceriodaphnia dubia (Method 1002.0)

once/quarter¹

Chronic static renewal 7-day survival & growth test
using fathead minnow (Pimephales promelas) (Method 1000.0)

once/quarter¹

¹ This facility will have a three year compliance schedule to meet toxicity testing requirements implemented into the permit renewal. The biomonitoring frequency shall be quarterly for the life of the permit.

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Dilution Series - The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. These additional concentrations shall be 31%, 41%, 55%, 73%, and 97%. The low-flow effluent concentration (critical low-flow dilution) and WET limit is defined as 97% effluent. The critical dilution is calculated in Appendix B-1 of this fact sheet. Results of all dilutions shall be documented in a full report according to the test method publication mentioned in the **Biomonitoring Section** under Whole Effluent Toxicity. This full report shall be submitted to the Office of Environmental Compliance as contained in the Reporting Paragraph located in the **Biomonitoring Section** of the permit.

The permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body. Modification or revocation of the permit is subject to the provisions of LAC 33:IX.2903. Accelerated or intensified toxicity testing may be required in accordance with Section 308 of the Clean Water Act.

See attached Biomonitoring recommendation for more information.

Outfalls 001, 002, 003, and 004

Final effluent limitations shall become effective on the effective date of the permit and expire on the expiration date of the permit.

Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg.	Weekly Avg.	Basis
CBOD ₅	317	10 mg/l	15 mg/l	Limits set in accordance with the Statewide Sanitary Effluent Limitations Policy (SSELP) for facilities of this treatment type and size.
TSS	475	15 mg/l	23 mg/l	Since there is no numeric water quality criterion for TSS, and in accordance with the current Water Quality Management Plan, the TSS effluent limitations shall be based on a case-by-case evaluation of the treatment technology being utilized at a facility. Therefore, a Technology Based Limit has been established through Best Professional Judgement for the type of treatment technology utilized at this facility.

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Effluent Characteristic	Monthly Avg. (lbs./day)	Monthly Avg.	Weekly Avg.	Basis
NH ₃ -N	127	4 mg/l	8 mg/l	Limits are based on the Anti-backsliding provision, which prohibits the renewal of an existing LPDES permit that contains effluent limits less stringent than those established in the previous permit.

Other Effluent Limitations

1) pH

According to LAC 33:IX.3705.A.1., POTW's must treat to at least secondary levels. Therefore, in accordance with LAC 33:IX.5905.C, the pH shall not be less than 6.0 standard units nor greater than 9.0 standard units at any time.

2) Solids and Foam

There shall be no discharge of floating solids or visible foam in other than trace amounts in accordance with LAC 33:IX.1113.B.7.

PREVIOUS PERMITS:

LPDES Permit No. LA0032221: Effective: December 1, 2003

Expired: January 31, 2007

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Monthly Avg.	Weekly Avg.	Measurement Frequency	Sample Type
<u>Outfalls 001, 002, 003, and 004</u>				
Flow	Report	Report	Continuous	Recorder
CBOD ₅	317 lb/day / 10 mg/l	15 mg/l	2/week	Grab
TSS	475 lb/day / 15 mg/l	23 mg/l	2/week	Grab
NH ₃ -N	127 lb/day / 4 mg/l	8 mg/l	2/week	Grab
TRC	less than 0.1 mg/l at any one time		2/week	Grab
pH	Range (6.0 su – 9.0 su)		2/week	Grab
Biomonitoring				
<i>Pimephales promelas</i>	Report	Report	1/quarter	24 Hour Comp.
<i>Ceriodaphnia dubia</i>	Report	Report	1/quarter	24 Hour Comp.
<u>Outfall 005</u>				
Fecal Coliform				
Colonies/100 ml	200	400	2/week	Grab

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XI. ENFORCEMENT AND SURVEILLANCE ACTIONS:**A) Inspections**

A review of the files indicates the following most recent inspections performed for this facility.

Date – June 11, 2007

Inspector – LDEQ

Findings and/or Violations –

- Areas of concern were found with operation and maintenance. Deflector plates missing and algae buildup found in sprinkler system of trickling filter system.
- New generators were installed to run plant during power outages.
- Algae build-up and bubbles were popping up in A – Primary Tank.
- Weirs washed daily but not the whole unit.
- Samples collected to test for chlorine at the equalization basin before water is pumped 1.5 miles away to ponds & Baygall system.
- C-train was operating at the time of the inspection.
- Lab Review – chain of custody did not reflect biotoxicity sample as a 24 hour composite.
- There were numerous biotoxicity failures and two TSS excursions from June 2006 through April 2007.
- There were several SSOs
- DMRs reflecting CBOD₅, TSS, and NH₃-N at 6 hour composites but were actually grab samples.

Date – February 1, 2008

Inspector – LDEQ

Findings and/or Violations –

- Observed Outfalls 001, 002, and 004. Outfall 001 was currently discharging. The discharge was clear with no odor or debris.
- C-train was off-line but expected to be back on-line in about two weeks.
- Numerous SSOs noted during May 2007 through January 2008. SSOs not caused by 1 & I.
- DMR review from May 2007 through December 2007 revealed three fecal coliform excursions and two TSS excursions.
- Flow meter was last calibrated on June 1, 2007.

B) Compliance and/or Administrative Orders

A review of the files indicates the following most recent enforcement action administered against this facility:

LDEQ Issuance:

Consolidated Compliance Order & Notice of Potential Penalty

Enforcement Tracking No. WE-CN-05-0178 and WE-CN-05-0178A

Date Issued – November 29, 2001, and February 28, 2007

Findings of Fact:

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1. The Respondent owns and/or operates a wastewater treatment facility known as the United States Army South Fort Polk Wastewater Treatment Plant located at Georgia Avenue Extension, Building 3970 in Fort Polk, Vernon Parish, Louisiana. The Respondent was issued NPDES permit LA0032221 effective July 29, 1991. In accordance with the assumption of the NPDES program by the state of Louisiana, NPDES permit LA0032221 became a LPDES permit. The Respondent submitted a permit renewal application in a timely manner and LPDES permit LA0032221 was administratively continued until it was reissued with an effective date of December 1, 2003. Under the terms and conditions of the permit, the Respondent is authorized to discharge treated sanitary wastewater from its facility into Drake's Creek; thence into Whiskey Chitto Creek; thence into the Calcasieu River, all waters of the state.
2. The Respondent was issued Compliance Order MM-C-03-0044 on July 3, 2003. The relevant violations of the Compliance Order were the unauthorized deposition of regulated solid waste onto the ground, operation and maintenance deficiencies, and exceedances of permit effluent limitations. The relevant requirements of the Compliance Order were to: cease the deposition of the regulated solid waste, immediately take any and all steps necessary to come into compliance with the solid waste regulations and LPDES permit LA0032221, and to submit to the Department a complete written report including a detailed description of the circumstances of the cited violations, the actions taken to achieve compliance with this and corrective or remedial actions taken to mitigate any damages resulting from the violations. Compliance Order MM-C-03-0044 is a final action of the Department and not subject to further review.
3. An inspection on June 17, 2003, and a subsequent file review on May 4, 2005, revealed the following violations:
 - A. The Respondent was not properly operating and maintaining the treatment plant. Specifically, one of the two primary digesters was overflowing onto the ground, the troughs for the secondary clarifiers at Plant A & B contained sludge, and the aerator on the final digester was not operational. According to the Respondent, in a response received by the Department on September 23, 2003, a clogged drain in the digester which caused the overflow was corrected on the same day as the inspection, the secondary clarifier troughs were cleaned on September 18, 2003, and the aerator on the final digester was brought back online the week of July 28, 2003.
 - B. The Respondent failed to follow approved test methods. Specifically, the calibration for the thermometer in the refrigerator that stores BOD samples had expired. According to the Respondent, in a response received by the Department on September 23, 2003, all of the thermometers were recalibrated on July 10, 2003, and the laboratory has instituted a calibration program for its thermometers.
4. An inspection on June 28, 2004, and a subsequent file review on May 4, 2005, revealed the following violations:
 - A. The Respondent failed to properly operate and maintain

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equipment. Specifically, the Outfall 003 flow meter had not been calibrated. According to the Respondent, in a response received by the Department on November 18, 2004, the flow meters were calibrated on July 30, 2004.

- B. The Respondent failed to submit an accurate DMR. Specifically, data was entered incorrectly into a spreadsheet which caused the loading calculation for TSS for the month of May 2004 to be incorrect. A revised DMR was submitted by the Respondent and received on July 12, 2004.
5. Inspections by the Department on June 28, 2004, and June 21, 2005, and the subsequent file reviews on May 4, 2005, and May 8, 2006, revealed numerous overflows had occurred as reported by the Respondent. From March 2004 through April 2006 revealed 40 overflows.
 6. Inspections on June 17, 2003, June 28, 2004, and June 21, 2005, the subsequent file reviews on May 4, 2005, and May 8, 2006, revealed numerous permit excursions, as reported by the Respondent on DMRs. From July 2003 through February 2006, there were 12 TSS excursions, 1 fecal coliform excursion, and 14 biomonitoring failures.
 7. The May 4, 2005, file review revealed the following violations:
 - A. The Respondent failed to submit complete DMRs. Specifically, the Respondent failed to report CBOD loadings for Outfalls 001, 002, 003, and 004 for December 2003, and CBOD, TSS, and Ammonia-Nitrogen loadings for Outfall 001, 002, 003, and 004 for January 2004.
 - B. The Respondent failed conduct the quarterly Biomonitoring for December 2003 to February 2004 as required by its permit when it was reissued on December 1, 2003.

Order:

1. To immediately take any and all steps necessary to meet and maintain compliance with the permit limitations and conditions contained in LPDES permit LA0032221.
2. To submit properly completed DMRs for the specific monitoring periods listed in the findings of fact.
3. In the event the Respondent believes that complete correction of the above cited deficiencies is not physically possible within 30 days, the Respondent shall submit a comprehensive plan for the expeditious elimination and prevention of such noncomplying discharges.
4. To submit a written report that includes a detailed description of the circumstances surrounding the cited violations and actions taken or to be taken to achieve compliance with the Compliance Order.

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C) DMR Review

A review of the discharge monitoring reports for the period beginning July 2006 through June 2008 has revealed the following violations:

Parameter	Outfall	Period of Excursion	Permit Limit	Reported Quantity
TSS, Monthly Avg.	001	September 2006	15 mg/l	16 mg/l
Fecal Coliform, Weekly Avg.	005	June 2007	400 cfu/100 ml	4,015 cfu/100 ml
TSS, Weekly Avg.	003	July 2007	23 mg/l	35 mg/l
Fecal Coliform, Weekly Avg.	005	September 2007	400 cfu/100 ml	792 cfu/100 ml
Fecal Coliform, Weekly Avg.	005	November 2007	400 cfu/100 ml	>1,836 cfu/100 ml
TSS, Monthly Avg.	001	December 2007	15 mg/l	21 mg/l
TSS, Weekly Avg.	001	December 2007	23 mg/l	36 mg/l
TSS, Monthly Avg.	001	January 2008	15 mg/l	25 mg/l
TSS, Weekly Avg.	001	January 2008	23 mg/l	46 mg/l
TSS, Weekly Avg.	002	June 2008	23 mg/l	24 mg/l

XII.

ADDITIONAL INFORMATION:

LDEQ reserves the right to impose more stringent discharge limitations and/or additional restrictions in the future. Additional limitations and/or restrictions are based upon water quality studies and can indicate the need for advanced wastewater treatment. Water quality studies of similar dischargers and receiving water bodies have resulted in monthly average effluent limitations of 5mg/L CBOD₅ and 2 mg/L NH₃-N. Prior to upgrading or expanding this facility, the permittee should contact LDEQ to determine the status of the work being done to establish future effluent limitations and additional permit conditions.

Final effluent loadings (i.e. lbs/day) have been established based upon the permit limit concentrations and the design capacity of 3.8 MGD.

Effluent loadings are calculated using the following example:

$$\text{CBOD}_5: 8.34 \text{ gal/lb} \times 3.8 \text{ MGD} \times 10 \text{ mg/l} = 317 \text{ lbs/day}$$

At present, the Monitoring Requirements, Sample Types, and Frequency of Sampling as shown in the permit are standard for facilities of flows between 1 MGD and 5 MGD.

Effluent CharacteristicsMonitoring RequirementsMeasurement SampleFrequency TypeOutfalls 001, 002, 003, and 004

Flow

Continuous

Recorder

CBOD₅

2/week

6 Hr. Composite

Total Suspended Solids

2/week

6 Hr. Composite

Ammonia-Nitrogen

2/week

6 Hr. Composite

pH

2/week

Grab

Outfall 005

Fecal Coliform Bacteria

2/week

Grab

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Biomonitoring

<u>Ceriodaphnia dubia</u> (Method 1002.0)	1/quarter	24 Hr. Composite
<u>Pimephales promelas</u> (Method 1000.0)	1/quarter	24 Hr. Composite

Compliance Schedule

In order to allow the permittee time to attain compliance with the WET limitation, **INTERIM LIMITS** are proposed for this facility.

The permittee shall achieve compliance with the **FINAL EFFLUENT LIMITATIONS** and **MONITORING REQUIREMENTS** for Outfall 005 as specified in accordance with the following schedule:

ACTIVITY	DATE
Achieve Interim Effluent Limitations and Monitoring Requirements	On the effective date of the permit
Achieve Final Effluent Limitations and Monitoring Requirements	Three years from the effective date of the permit

The above listed activities must be achieved on or before the deadline date. Additionally, the permittee shall submit a progress report outlining the status of all facility improvements on a yearly basis until compliance is achieved.

The Permittee shall achieve sustained compliance with Final Effluent Limitations.

No later than 14 days following a date for a specific action (as opposed to a report of progress), the permittee shall submit a written notice of compliance or noncompliance.

Pretreatment Requirements

Based upon consultation with LDEQ pretreatment personnel, general pretreatment language will be used due to the lack of either an approved or required pretreatment program.

Pollution Prevention Requirements

The permittee shall institute or continue programs directed towards pollution prevention. The permittee shall institute or continue programs to improve the operating efficiency and extend the useful life of the facility. The permittee will complete an annual Environmental Audit Report **each year** for the life of this permit according to the schedule below. The permittee will accomplish this requirement by completing an Environmental Audit Form which has been attached to the permit. All other requirements of the Municipal Wastewater Pollution Prevention Program are contained in Part II of the permit.

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The audit evaluation period is as follows:

Audit Period Begins	Audit Period Ends	Audit Report Completion Date
Effective Date of Permit	12 Months from Audit Period Beginning Date	3 Months from Audit Period Ending Date

Stormwater Discharges

Because the design flow of the facility is equal to or greater than 1.0 MGD and in accordance with LAC 33:IX.2511.B.14.i, the facility may contain storm water discharges associated with industrial activity. Therefore, in accordance with LAC 33:IX.2511.A.1.b, specific requirements addressing stormwater discharges will be included in the discharge permit.

Acceptance of Hauled Domestic Septage

The permit application indicated that hauled domestic septage was being accepted at the facility. Therefore, specific requirements pertaining to the acceptance of hauled domestic septage has been included in the discharge permit.

XIII**TENTATIVE DETERMINATION:**

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to reissue a permit for the discharge described in this Statement of Basis.

XIV**REFERENCES:**

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 8, "Wasteload Allocations / Total Maximum Daily Loads and Effluent Limitations Policy," Louisiana Department of Environmental Quality, 2007.

Louisiana Water Quality Management Plan / Continuing Planning Process, Vol. 5, "Water Quality Inventory Section 305(b) Report," Louisiana Department of Environmental Quality, 2006.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Chapter 11 - "Louisiana Surface Water Quality Standards," Louisiana Department of Environmental Quality, 2008.

Louisiana Administrative Code, Title 33 - Environmental Quality, Part IX - Water Quality Regulations, Subpart 2 - "The LPDES Program," Louisiana Department of Environmental Quality, 2008.

Low-Flow Characteristics of Louisiana Streams, Water Resources Technical Report No. 22, United States Department of the Interior, Geological Survey, 1980.

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Index to Surface Water Data in Louisiana, Water Resources Basic Records Report No. 17, United States Department of the Interior, Geological Survey, 1989.

LPDES Permit Application to Discharge Wastewater, United States Department of the Army, South Fort Polk Wastewater Treatment Plant, June 4, 2008.

STREAM FLOW CHARACTERISTICS REPORT

MEMORANDUM

TO: Todd Franklin

DATE: August 11, 2008

RE: Stream Flow and Water Quality Characteristics for Drake's Creek, receiving water for the United States Department of the Army / South Fort Polk Wastewater Treatment Plant (Permit No. LA0032221, AI: 8994)

Determinations of water quality characteristics for Outfalls 001-005 were taken from random monitoring station #2443 at Drake's Creek, 4.0 miles northeast of Fort Polk, Louisiana, at the bridge on Mill Creek Road, 1.0 mile east of LA Highway 184. The following hardness and TSS data was determined based on two separate samples:

Average hardness = 49 mg/l
15th percentile TSS = 11.25 mg/l

Based on a memorandum from Max Forbes to Gwen Berthelot, dated September 7, 2002, flow measurements were taken during the estimated 7Q10 range. The measured flow was 0.177 cfs.

APPENDIX B-1

Water Quality Screen

wqsmo.dn.wk4	Date:	11/24	Appendix B-1	Page	1
Developer: Bruce Fielding	Time:	07:58 AM			
Software: Lotus 4.0			LA0032221; AJ 8994		
Revision date: 02/14/05					
	Water Quality Screen for	US Dept. of the Army / South Fort Polk			
Input variables:					
Receiving Water Characteristics:		Dilution:		Toxicity Dilution Series:	
		ZID F _s =	0.1	Biomonitoring dilution:	0.970776
Receiving Water Name=	Drakes Creek			Dilution Series Factor:	0.75
Critical flow (Q _r) cfs=	0.177	MZ F _s =	1		
Harm. mean/avg tidal cfs=		Critical Q _r (MGD)=	0.114395		Percent Effluent
Drinking Water=1 HHNPCR=2		Harm. Mean (MGD)=	0.114395	Dilution No. 1	97.078%
Marine, 1=y, 0=n		ZID Dilution =	0.996999	Dilution No. 2	72.8082%
Rec. Water Hardness=	49	MZ Dilution =	0.970776	Dilution No. 3	54.6061%
Rec. Water TSS=	11.25	HHnc Dilution=	0.970776	Dilution No. 4	40.9546%
Fisch/Specific=1,Stream=0		HHc Dilution=	0.970776	Dilution No. 5	30.7160%
Diffuser Ratio=		ZID Upstream =	0.00301		
		MZ Upstream =	0.030104	Partition Coefficients; Dissolved-->Total	
Effluent Characteristics:		MZhhnc Upstream=	0.030104		
Permittee=	US Dept. of the Army / South Fort Polk			METALS	FW
Permit Number=	LA0032221; AJ 8994			Total Arsenic	1.922683
Facility flow (Q _{ef})MGD=	3.8	MZhhc Upstream=	0.030104	Total Cadmium	3.920184
		ZID Hardness=	---	Chromium III	4.980338
Outfall Number =	001	MZ Hardness=	---	Chromium VI	1
Eff. data, 2=lbs/day		ZID TSS=	---	Total Copper	2.95134
MLL, 2=lbs/day		MZ TSS=	---	Total Lead	5.543479
Effluent Hardness=	N/A	Multipliers:		Total Mercury	3.066506
Effluent TSS=	N/A	WLA _a --> LTA _a	0.32	Total Nickel	2.387368
WQBL ind. 0=y, 1=n		WLA _c --> LTA _c	0.53	Total Zinc	3.583781
Acute/Chr. ratio 0=n, 1=y		LTA _{a,c} --> WQBL avg	1.31		
Aquatic, acute only 1=y, 0=n		LTA _{a,c} --> WQBL max	3.11	Aquatic Life, Dissolved	
		LTA _h --> WQBL max	2.38	Metal Criteria, ug/L	
Page Numbering/Labeling		WQBL limit/report	2.13	METALS	ACUTE CHRONIC
Appendix	Appendix B-1	WLA Fraction	1	Arsenic	339.8 150
Page Numbers 1=y, 0=n	1	WQBL Fraction	1	Cadmium	14.67391 0.608203
Input Page # 1=y, 0=n	1			Chromium III	305.9396 99.24365
		Conversions:		Chromium VI	15.712 10.582
Fischer/Site Specific inputs:		ug/L --> lbs/day Q _{ef}	0.031692	Copper	9.408853 6.677465
Pipe=1, Canal=2, Specific=3		ug/L --> lbs/day Q _{eo}	0	Lead	29.46769 1.148313
Pipe width, feet		ug/L --> lbs/day Q _r	0.001476	Mercury	1.734 0.012
ZID plume dist., feet		lbs/day --> ug/L Q _{eo}	31.5537	Nickel	774.0821 85.96803
MZ plume dist., feet		lbs/day --> ug/L Q _{ef}	31.5537	Zinc	62.53296 57.10207
HHnc plume dist., feet		diss --> tot 1=y, 0=n	1		
HHc plume dist., feet		Cu diss --> tot 1=y, 0=n	1	Site Specific Multiplier Values:	
		cfs --> MGD	0.6463	CV =	---
Fischer/site specific dilutions:				N =	---
Dilution =	---	Receiving Stream:		WLA _a --> LTA _a	---
F/specific MZ Dilution =	---	Default Hardness=	25	WLA _c --> LTA _c	---
F/specific HHnc Dilution=	---	Default TSS=	10	LTA _{a,c} --> WQBL avg	---
F/specific HHc Dilution=	---	99 Crit., 1=y, 0=n	1	LTA _{a,c} --> WQBL max	---
				LTA _h --> WQBL max	---

Appendix B-1												Page	2
US Dept. of the Army / South Fort Polk													
LA0032221 ; AI 8994													
(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)	(*8)	(*9)	(*10)	(*11)			
Toxic	Cu	Effluent	Effluent	MQL	Effluent	95th %	Numerical Criteria				HH		
Parameters	Instream	/Tech	/Tech		1=No 95%	estimate	Acute	Chronic	HHNDW	Carcinogen			
	Conc.	(Avg)	(Max)		0=95 %	Non-Tech	FW	FW		Indicator			
	ug/L	ug/L	ug/L	ug/L		ug/L	ug/L	ug/L	ug/L	"C"			
NONCONVENTIONAL													
Total Phenols (4AAP)				5			700	350	50				
3-Chlorophenol				10									
4-Chlorophenol				10			383	192					
2,3-Dichlorophenol				10									
2,5-Dichlorophenol				10									
2,6-Dichlorophenol				10									
3,4-Dichlorophenol				10									
2,4-Dichlorophenoxy-													
acetic acid (2,4-D)													
2-(2,4,5-Trichlorophen-													
oxy) propionic acid													
(2,4,5-TP, Silvex)													
METALS AND CYANIDE													
Total Arsenic		13		10	0	27.69	653.3276	288.4024					
Total Cadmium				1			57.52443	2.384268					
Chromium III				10			1523.683	494.2669					
Chromium VI				10			15.712	10.582					
Total Copper				10			27.76873	19.70747					
Total Lead				5			163.3535	6.365652					
Total Mercury				0.2			5.317321	0.036798					
Total Nickel				40			1848.019	205.2373					
Total Zinc				20			224.1044	204.6413					
Total Cyanide				20			45.9	5.4	12844				
DIOXIN													
2,3,7,8 TCDD; dioxin				1.0E-05					7.2E-07	C			
VOLATILE COMPOUNDS													
Benzene				10			2249	1125	12.5	C			
Bromoform				10			2930	1465	34.7	C			
Bromodichloromethane				10					3.3	C			
Carbon Tetrachloride				10			2730	1365	1.2	C			
Chloroform				10			2890	1445	70	C			
Dibromochloromethane				10					5.08	C			
1,2-Dichloroethane				10			11800	5900	6.8	C			
1,1-Dichloroethylene				10			1160	580	0.58	C			
1,3-Dichloropropylene				10			606	303	162.79				
Ethylbenzene				10			3200	1600	8100				
Methyl Chloride				50			55000	27500					
Methylene Chloride				20			19300	9650	87	C			
1,1,2,2-Tetrachloro-													
ethane				10			932	466	1.8	C			

Appendix B-1														Page 3
US Dept. of the Army / South Fort Polk														
LA0032221, AJ 8994														
(*1)		(*12)	(*13)	(*14)	(*15)	(*16)	(*17)	(*18)	(*19)	(*20)	(*21)	(*22)	(*23)	
Toxic		WLAa	WLAc	WLAh	LTAa	LTAc	LTAh	Limiting	WQBL	WQBL	WQBL	WQBL	Need	
Parameters		Acute	Chronic	HHNDW	Acute	Chronic	HHNDW	A.C.I.H	Avg	Max	Avg	Max	WQBL	
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	001	001	001	001	WQBL	
NONCONVENTIONAL														
Total Phenols (4AAP)		702.1073	360.5364	51.5052	224.6743	191.0843	51.5052	51.5052	51.5052	122.5824	1.632303	3.884881	no	
3-Chlorophenol		---	---	---	---	---	---	---	---	---	---	---	no	
4-Chlorophenol		384.153	197.78	---	122.929	104.8234	---	104.8234	137.3186	326.0007	4.351902	10.33161	no	
2,3-Dichlorophenol		---	---	---	---	---	---	---	---	---	---	---	no	
2,5-Dichlorophenol		---	---	---	---	---	---	---	---	---	---	---	no	
2,6-Dichlorophenol		---	---	---	---	---	---	---	---	---	---	---	no	
3,4-Dichlorophenol		---	---	---	---	---	---	---	---	---	---	---	no	
2,4-Dichlorophenoxy- acetic acid (2,4-D)		---	---	---	---	---	---	---	---	---	---	---	no	
2-(2,4,5-Trichlorophen- oxy) propionic acid (2,4,5-TP, Silvex)		---	---	---	---	---	---	---	---	---	---	---	no	
METALS AND CYANIDE														
Total Arsenic		655.2944	297.0845	---	209.6942	157.4548	---	157.4548	206.2658	489.6843	6.536974	15.51908	no	
Total Cadmium		57.6976	2.456044	---	18.46323	1.301703	---	1.301703	1.705231	4.048297	0.054042	0.128299	no	
Chromium III		1528.27	509.1463	---	489.0463	269.8475	---	269.8475	353.5003	839.2259	11.20313	26.59675	no	
Chromium VI		15.7593	10.90056	---	5.042976	5.777297	---	5.042976	6.606298	15.68365	0.209367	0.497046	no	
Total Copper		27.85232	20.30074	---	8.912743	10.75939	---	8.912743	11.67569	27.71863	0.370026	0.878459	no	
Total Lead		163.8453	6.557283	---	52.43049	3.47536	---	3.47536	4.552722	10.80837	0.144285	0.342539	no	
Total Mercury		5.333328	0.037906	---	1.706665	0.02009	---	0.02009	0.026318	0.06248	0.000834	0.00198	no	
Total Nickel		1853.582	211.4158	---	593.1463	112.0504	---	112.0504	146.786	348.4766	4.651941	11.04392	no	
Total Zinc		224.7791	210.8019	---	71.92931	111.725	---	71.92931	94.2274	223.7002	2.986255	7.089505	no	
Total Cyanide		46.03818	5.562561	13230.66	14.73222	2.948158	13230.66	2.948158	3.862086	9.16877	0.122397	0.290577	no	
DIOXIN														
2,3,7,8 TCDD; dioxin		---	---	7.42E-07	---	---	7.42E-07	7.42E-07	7.42E-07	1.77E-06	2.35E-08	5.59E-08	no	
VOLATILE COMPOUNDS														
Benzene		2255.77	1158.867	12.8763	721.8465	614.1995	12.8763	12.8763	12.8763	30.64559	0.408076	0.97122	no	
Bromoform		2938.82	1509.102	35.74461	940.4225	799.8242	35.74461	35.74461	35.74461	85.07217	1.132818	2.696107	no	
Bromodichloromethane		---	---	3.399343	---	---	3.399343	3.399343	3.399343	8.090437	0.107732	0.256402	no	
Carbon Tetrachloride		2738.218	1406.092	1.236125	876.2299	745.2287	1.236125	1.236125	1.236125	2.941977	0.039175	0.093237	no	
Chloroform		2898.7	1488.5	72.10728	927.584	788.9051	72.10728	72.10728	72.10728	171.6153	2.285224	5.438833	no	
Dibromochloromethane		---	---	5.232928	---	---	5.232928	5.232928	5.232928	12.45437	0.165842	0.394704	no	
1,2-Dichloroethane		11835.52	6077.613	7.004707	3787.367	3221.135	7.004707	7.004707	7.004707	16.6712	0.221993	0.528344	no	
1,1-Dichloroethylene		1163.492	597.4603	0.59746	372.3175	316.654	0.59746	0.59746	0.59746	1.421956	0.018935	0.045065	no	
1,3-Dichloropropylene		607.8243	312.1215	167.6906	194.5038	165.4244	167.6906	165.4244	216.706	514.4699	6.867845	16.30458	no	
Ethylbenzene		3209.633	1648.166	8343.842	1027.083	873.5282	8343.842	873.5282	1144.322	2716.673	36.26585	86.09679	no	
Methyl Chloride		55165.57	28327.86	---	17652.98	15013.77	---	15013.77	19668.03	46692.81	623.3193	1479.789	no	
Methylene Chloride		19358.1	9940.503	89.61905	6194.592	5268.467	89.61905	89.61905	89.61905	213.2933	2.840207	6.759692	no	
1,1,2,2-Tetrachloro- ethane		934.8057	480.0285	1.854187	299.1378	254.4151	1.854187	1.854187	1.854187	4.412965	0.058763	0.139856	no	

APPENDIX I

APPENDIX I

Numeric Toxic Limits: LDEQ has reviewed and evaluated the effluent analyses submitted by the permittee on June 4, 2008, and examined the following pollutants that are regulated by LAC 33:IX.1113.C.6. in accordance with the implementation procedures outlined under the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, April 16, 2008. Please see Appendix B-1, Water Quality Screen Spreadsheet.

Pollutant	Ce ¹	Ce x 2.13 ²	Water Quality Based Limit ³	Drinking Water Source?	Permit Limit?
Total Arsenic	13 µg/L	27.69 µg/L	206.3 µg/l	No	No

- 1/ Metals concentration results were presented as total metals in lab analysis submitted by the permittee. All pollutants calculated in µg/l.
- 2/ For the reported effluent concentrations (Ce) it is estimated that 95% of the concentrations of chemicals taken over time will be 2.13 times the Ce or less.
- 3/ The water quality based limit is the maximum allowable average instream concentration for that pollutant to be in compliance with water quality standards. Louisiana Water Quality Criteria for metals are hardness dependent, and expressed as dissolved metals. The water quality based limit is calculated with a conversion for metals limits expressed as total metals.

The following steps were used in evaluating the potential toxicity of the analyzed pollutants (see Appendix B-1):

- i. An evaluation of the applicability of the effluent data.

Results of the priority pollutant screen were entered and compared to EPA's Minimum Quantification Levels (MQL's) to determine the potential presence of the respective toxic pollutant. Those pollutants with reported laboratory Method Detection Levels (MDL's) which exceed their respective EPA MQL's are determined to be reasonably present in the effluent and an evaluation of their potential toxicity is determined. Those pollutants with MDLs less than the MQL are determined to be not potentially present in the effluent and eliminated from further evaluation.

- ii. Calculation of permit limits based on applicable water quality standards.

Applicable water quality criteria are listed in the Appendix B-1 in Columns 8-10. These values were used to calculate the Waste Load Allocations (WLAs) for each of the toxic pollutants. The WLA is the maximum allowable concentration of a pollutant necessary to meet the respective water quality criteria. The WLAs are calculated as described in the State's Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, dated April 16, 2008, as follows (Total Arsenic is used as the example pollutant for the following calculations):

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Complete Mix Balance Model for Waste Load Allocation

Q_e = plant effluent, MGD = 3.8
 Q_r = critical flow of receiving stream, 0.177 cfs
 F_s = MZ, ZID flow fraction, LAC 33:IX.1115.D.7 and 8 (MZ = 1, and ZID = 0.1)
 C_r = numerical criteria value from LAC 33:IX.1113, Table 1
 C_u = ambient instream concentration for pollutant. In the absence of accurate supporting data, assume $C_u = 0$
WLA = concentration for pollutant at end-of-pipe based on aquatic life and human health numerical criteria (site specific dilution type)
LTA = long term average, units same as WLA
WQBL = effluent water quality based limit.

$$\text{Dilution factor} = \frac{Q_e}{(Q_r F_s + Q_e)}$$

$$\begin{aligned} \text{Dilution factor (acute)} &= \frac{3.8}{(0.177)(0.6463)(0.1) + 3.8} \\ &= 0.997 \end{aligned}$$

$$\begin{aligned} \text{Dilution factor (chronic)} &= \frac{3.8}{(0.177)(0.6463)(1) + 3.82} \\ &= 0.971 \end{aligned}$$

$$\text{WLA} = (C_r / \text{Dilution factor}) - (F_s Q_r C_u / Q_e)$$

iii. Conversion of dissolved metals criteria for aquatic life to total metals.

Metals criteria for aquatic life protection are based on dissolved metals concentrations and hardness values averaged from data compilations contained in the Louisiana Water Quality Data Summary. A dissolved to total metal conversion will be implemented. Hardness and TSS are a function of the conversion. This involves determining a linear partition coefficient for the metal of concern and using this to determine the fraction of metal dissolved, so that the dissolved metal ambient criteria may be translated to a total effluent limit. The average hardness value used for the analysis is 49 mg/l CaCO_3 (USGS data). The 15th percentile TSS value is 11.25 mg/l. The formula for converting dissolved metals to total metals for streams and lakes are provided below.

K_p = Linear partition coefficient
 K_{po} = found in Table A below
 α = found in Table A below
TSS = total suspended solids concentration found in receiving stream or approximation thereof (nearest most representative site), lowest 15th percentile, units in mg/l
 C_D/C_T = Fraction of metal dissolved
 C_r = Dissolved criteria value for metal in water quality standards

$$K_p = K_{po} \times \text{TSS}^\alpha$$

$$K_p = (0.48 \times 10^6) \times 11.25^{(-0.73)}$$

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$$\text{then, } \frac{C_D}{C_T} = \frac{1}{1 + (K_p)(TSS)(10^{-6})}$$

$$\frac{C_D}{C_T} = \frac{1}{1 + (82,016.25)(11.25)(10^{-6})} = 0.52$$

therefore,

$$\text{Total Metal} = \frac{C_r}{(C_D/C_T)}$$

TABLE A

LINEAR PARTITION COEFFICIENTS
FOR PRIORITY METALS IN STREAMS AND LAKES

(Delos et. al, 1984) (*1)

METAL	STREAMS		LAKES	
	K_{po}	α	K_{po}	α
Arsenic	0.48×10^6	-0.73	0.48×10^6	-0.73
Cadmium	4.00×10^6	-1.13	3.52×10^6	-0.92
Chromium III (*2)	3.36×10^6	-0.93	2.17×10^6	-0.27
Copper	1.04×10^6	-0.74	2.85×10^6	-0.9
Lead	2.80×10^6	-0.8	2.04×10^6	-0.53
Mercury	2.90×10^6	-1.14	1.97×10^6	-1.17
Nickel	0.49×10^6	-0.57	2.21×10^6	-0.76
Zinc	1.25×10^6	-0.7	3.34×10^6	-0.68

(*1) Delos, C. G., W. L. Richardson, J. V. DePinto, R. B. Ambrose, P. W. Rogers, K. Rygwelski, J. P. St. John, W. J. Shaughnessey, T. A. Faha, W. N. Christie. Technical Guidance for performing Waste Load Allocations, Book II: Streams and Rivers. Chapter 3: Toxic Substances, for the U. S. Environmental Protection Agency. (EPA-440/4-84-022).

(*2) Linear partition coefficients shall not apply to the Chromium VI numerical criterion. The approved analytical method for Chromium VI measures only the dissolved form. Therefore, permit limits for Chromium VI shall be expressed in the dissolved form. (See 40 CFR 122.45(c)(3)).

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$$WLA_{a,c,h} = (Cr/Dilution\ factor) - (FsQrCu/Qe)$$

$$WLA_{acute} = (653.46/0.997) - [(0.1)(0.177)(0)/3.8] = 655.43$$

$$WLA_{chronic} = (288.46/0.971) - [(1)(0.177)(0)/3.8] = 297.08$$

iv. Calculation of Long Term Averages (LTA's) and Permit Limits.

Comparison of the reported effluent data (converted to the 95th percentile) to the calculated effluent limitations. Long term averages are listed in the Appendix B-1 in Columns 15-17.

Long term averages are calculated for each WLA (based on aquatic and human health criteria). The LTA's are calculated as follows:

$$LTA_a = WLA_a \times 0.32$$

$$LTA_c = WLA_c \times 0.53$$

$$LTA_h = WLA_h$$

$$LTA_{acute} = 655.43 \times 0.32 = 209.38$$

$$LTA_{chronic} = 297.08 \times 0.53 = 157.45$$

A comparison of each LTA is made and the lowest (most restrictive) is selected to calculate the effluent limitations. The most limiting LTA is listed in Appendix B-1, Column 18.

Calculation of permit limits if aquatic life LTA is more limiting:

$$\text{Daily Average} = \text{Min}(LTA_a, LTA_c) \times 1.31$$

$$\text{Daily Maximum} = \text{Min}(LTA_a, LTA_c) \times 3.11$$

$$\text{Daily Average} = 157.45 \times 1.31 = 206.26 \mu\text{g/l}$$

$$\text{Daily Maximum} = 157.45 \times 3.11 = 489.67 \mu\text{g/l}$$

If human health LTA is more limiting:

$$\text{Daily Average} = LTA_h$$

$$\text{Daily Maximum} = LTA_h \times 2.38$$

The resulting allowable effluent concentration is converted to a mass value using the following formula:

$$\begin{aligned} \text{lbs/day} &= (0.20626 \text{ mg/l}) \times 8.34 \times 3.8 \text{ MGD} \\ &= 6.54 \text{ lbs/day} \end{aligned}$$

Comparison of the reported effluent data (converted to 95th percentile) is made to the calculated effluent limitations. Water Quality Based limits are listed in Appendix B-1, Columns 19-22.

In accordance with the State of Louisiana's implementation procedures, the reported effluent concentration is compared to the calculated daily average concentration. If the effluent concentration is greater than the calculated daily average concentration, then a reasonable potential exists and an effluent limitation for the pollutant of concern is imposed in the permit. (Please refer to Appendix B-1 for the calculated daily average concentration listed in Column 19 and the effluent concentration listed in Column 3.)

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The discharge is considered to pose a reasonable potential to cause a water quality excursion if the estimated 95th percentile of a pollutant in the effluent will result in an instream waste concentration, which is above the applicable State water quality criterion. The 95th percentile of possible effluent concentrations are estimated as follows:

$$C_{95} = C_{\text{mean}} * \exp (1.645 * \Phi - 0.5 * \Phi^2)$$

where: 1.645 = normal distribution factor at 95th percentile

$$\Phi^2 = \ln(CV^2 + 1)$$

if CV is assumed = 0.6,

$$\Phi^2 = 1.307$$

The ratio of the estimated 95th percentile value to the mean (C_{95}/C_{mean}) is calculated :

$$C_{95}/C_{\text{mean}} = 2.13$$

Based upon review of the permittee's effluent data, there are no pollutants present or potentially present in the effluent discharge in such concentrations that would cause an exceedance of Louisiana's Water Quality Standards. A summary of the evaluation of the permittee's effluent analysis of the toxic pollutants is listed in Appendix B-1.

WQBL CALCULATIONS

WQBL CALCULATIONS

US DEPT OF THE ARMY / SOUTH FORT POLK WWTP

LA0032221, AI 8994, PER20080002

DESIGN CAPACITY (Q_c): 3.8 MGD

CRITICAL LOW FLOW (7Q10): 0.177 cfs

HARDNESS VALUE: 49 mg/L

FIFTEENTH PERCENTILE VALUE FOR TSS: 11.25 mg/L

PRIORITY POLLUTANT: ARSENIC

DISSOLVED METAL CRITERIA

- Zn (Acute) = 339.8 $\mu\text{g/L}$

- Zn (Chronic) = 150 $\mu\text{g/L}$

DISSOLVED TO TOTAL METAL CONVERSION

$$\frac{C_D}{C_T} = \frac{1}{1 + (K_p)(\text{TSS})(10^{-6})}$$

$$K_p = K_{po} \times \text{TSS}^a$$

$$K_p = 0.48 \times 10^6 \times 11.25^{(-0.73)}$$

$$= 82,016.25$$

$$\frac{C_D}{C_T} = \frac{1}{1 + (82,016.25)(11.25)(10^{-6})}$$

$$= \frac{1}{1.92}$$

$$= 0.52$$

	DISSOLVED	÷	C_D / C_T	=	TOTAL
Acute Criteria	339.8 $\mu\text{g/L}$	÷	0.52	=	653.46 $\mu\text{g/L}$
Chronic Criteria	150 $\mu\text{g/L}$	÷	0.52	=	288.46 $\mu\text{g/L}$

SUMMARY

	DISSOLVED	TOTAL
ACUTE CRITERIA	339.8 $\mu\text{g/L}$	653.46 $\mu\text{g/L}$
CHRONIC CRITERIA	150 $\mu\text{g/L}$	288.46 $\mu\text{g/L}$

DILUTION CALCULATIONS

$$\text{DILUTION FACTOR} = \frac{Q_e}{Q_r \times F_s + Q_e}$$

$$\bullet \text{ ZID (ACUTE)} = \frac{3.8 \text{ MGD}}{(0.177 \text{ cfs})(0.6463 \text{ MGD/cfs})(0.1 \text{ cfs}) + 3.8 \text{ MGD}} = 0.997$$

$$\bullet \text{ MZ (CHRONIC)} = \frac{3.8 \text{ MGD}}{(0.177 \text{ cfs})(0.6463 \text{ MGD/cfs})(1 \text{ cfs}) + 3.8 \text{ MGD}} = 0.971$$

CONCLUDE THAT:

99.7% of effluent at edge of ZID

97.1% of effluent at edge of MZ

WASTELOAD ALLOCATION CALCULATIONS

$$\text{WLA} = \frac{C_r}{\text{Dilution}} - \frac{F_s \times C_r \times C_u}{Q_e} \quad C_u = 0$$

$$\bullet \text{ WLA}_{\text{ZID}} (\text{ACUTE}) = \frac{653.46 \mu\text{g/L}}{0.997} = 655.43 \mu\text{g/L}$$

$$\bullet \text{ WLA}_{\text{MZ}} (\text{CHRONIC}) = \frac{288.46 \mu\text{g/L}}{0.971} = 297.08 \mu\text{g/L}$$

LTA CALCULATIONS

$$\begin{aligned} \bullet \text{ LTA}_{\text{ZID}} (\text{ACUTE}) &= \text{WLA}_{\text{ZID}} \times 0.32 \\ &= 655.43 \mu\text{g/L} \times 0.32 = 209.38 \mu\text{g/L} \end{aligned}$$

$$\begin{aligned} \bullet \text{ LTA}_{\text{MZ}} (\text{CHRONIC}) &= \text{WLA}_{\text{MZ}} \times 0.53 \\ &= 297.08 \mu\text{g/L} \times 0.53 = 157.45 \mu\text{g/L} \end{aligned}$$

WQBL CALCULATIONS

LIMITING LTA = 157.45 $\mu\text{g/l}$

- MONTHLY AVERAGE = LIMITING LTA X 1.31
= 157.45 $\mu\text{g/L}$ X 1.31
= 206.26 $\mu\text{g/L}$
= 0.20626 mg/L X 3.8 MGD X 8.34 lbs/day = **6.54 lbs/day**
- DAILY MAXIMUM = LIMITING LTA X 3.11
= 157.45 $\mu\text{g/L}$ X 3.11
= 489.67 $\mu\text{g/L}$
= 0.48967 mg/L X 3.8 MGD X 8.34 lbs/day = **15.52 lbs/day**

BIOMONITORING REQUIREMENTS

BIOMONITORING FREQUENCY RECOMMENDATION AND RATIONALE FOR ADDITIONAL REQUIREMENTS

Permit Number: **LA0032221**
 Facility Name: **South Fort Polk WWTF**
 Previous Critical Biomonitoring Dilution: **97%**
 Proposed Critical Biomonitoring Dilution: **97% (WET Limit)**
 Date of Review: **09/15/08** Name of Reviewer: **Laura Thompson**

Recommended Frequency by Species:

Pimephales promelas (Fathead minnow): **Once/Quarter¹**
Ceriodaphnia dubia (water flea): **Once/Quarter¹**

Recommended Dilution Series: **31%, 41%, 55%, 73%, and 97%**

Number of Tests Performed during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **56**
Daphnia pulex (water flea): **N/A – Testing of species was not required**
Ceriodaphnia dubia (water flea): **50**

Number of Failed Tests during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **15 lethal, 18 sub-lethal**
Daphnia pulex (water flea): **N/A – Testing of species was not required**
Ceriodaphnia dubia (water flea): **7 sub-lethal**

Failed Test Dates during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **Testing periods of: 6/1/04-8/31/04 (baygall 3, sub-lethal); 12/1/04-2/28/05 (baygall 2, sub-lethal); 3/1/05-5/31/05 (baygall 2, lethal & sub-lethal); 3/1/05-5/31/05 (baygall 3, lethal & sub-lethal); 6/1/05-8/31/05 (baygall 4, lethal & sub-lethal); 12/1/05-2/28/06 (baygall 2, lethal & sub-lethal); 12/1/05-2/28/06 (baygall 2, retest, lethal & sub-lethal); 12/1/05-2/28/06 (baygall 3, lethal & sub-lethal); 6/1/06-8/31/06 (baygall 4, lethal & sub-lethal); 9/1/06-11/30/06 (baygall 1, lethal & sub-lethal); 11/26/06-2/24/07 (baygall 3, lethal & sub-lethal); 11/26/06-2/24/07 (baygall 4, lethal & sub-lethal);**

¹ This facility will have a three year compliance schedule to meet toxicity testing requirements implemented into the permit renewal. The biomonitoring frequency shall be quarterly for the life of the permit.

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Daphnia pulex (water flea):

Ceriodaphnia dubia (water flea):

lethal); 12/1/06-2/28/07 (baygall 3, lethal & sub-lethal); 12/1/06-2/28/07 (baygall 4, lethal & sub-lethal); 2/25/07-5/26/07 (baygall 3, lethal & sub-lethal); 3/1/07-5/31/07 (baygall 3, lethal & sub-lethal); 12/1/07-2/28/08 (baygall 1, sub-lethal); 3/1/08-5/31/08 (baygall 1, lethal & sub-lethal)

N/A – Testing of species was not required

Testing periods of: 6/1/04-8/31/04 (baygall 1, sub-lethal); 6/1/04-8/31/04 (baygall 3, sub-lethal); 9/1/04-11/30/04 (baygall 1, sub-lethal); 6/1/05-8/31/05 (baygall 4, sub-lethal); 12/1/05-2/28/06 (baygall 3, sub-lethal); 11/26/06-2/24/07 (baygall 4, sub-lethal); 12/1/06-2/28/07 (baygall 4, sub-lethal);

Previous TRE Activities:

The US Dept. of the Army/South Fort Polk WWTP experienced a lethal and sub-lethal toxicity failure to the *Pimephales promelas* during a routine test performed February 7, 2006. A retest performed February 28, 2006 confirmed the toxicity and required the facility to begin a Toxicity Reduction Evaluation (TRE). A TRE Action Plan was received by LDEQ on May 26, 2006. The TRE Action Plan was missing the Quality Assurance Plan as required by LA0032221. A revised TRE Action Plan was received on February 14, 2007, which contained all necessary requirements. The final report was received on July 3, 2008. The report states that “the observed toxicity in effluent from the South Fort Polk Wastewater Treatment Plant appears to have a biological cause, most likely one or more species of bacteria or fungi”. The final report also states that “using the Isolation Test Design... improves survival and usually results in a passing WET test”. South Fort Polk Wastewater Treatment Plant ran an isolation configuration test concurrent with the standard retests in March and April 2006. In a letter dated May 19, 2006, Fort Polk requested approval to apply the isolation configuration procedure included in EPA Test Method 1000.0 for the *Pimephales promelas*. Because the isolation configuration procedure is consistent with the approved EPA Test Method 1000.0 for biomonitoring of the *Pimephales promelas*, the alternative method for testing is accepted by LDEQ.

Additional Requirements (including WET Limits) Rationale / Comments Concerning Permitting:

The US Dept. of the Army/South Fort Polk WWTP owns and operates an existing publicly owned treatment works serving the southern part of the Joint Readiness Training Center and Fort Polk in Fort Polk, Vernon Parish, Louisiana. LPDES Permit LA0032221, effective December 1, 2003, contained freshwater chronic biomonitoring as an effluent characteristic of Outfall 001 for *Ceriodaphnia dubia* and *Pimephales promelas*. The effluent series consisted of 31%, 41%, 55%, 73%, and 97% concentrations, with 97% effluent concentration being defined as the critical biomonitoring dilution. The testing was to be

FRESHWATER CHRONIC

performed quarterly for the *Ceriodaphnia dubia* and *Pimephales promelas*. Toxicity testing data on file shows 7 sub-lethal failures to the *Ceriodaphnia dubia* and 15 lethal and 18 sub-lethal failures to the *Pimephales promelas* during the past five years.

A reasonable potential analysis was conducted which demonstrated a finding of reasonable potential for lethal and sub-lethal toxicity based on the last five years of reported biomonitoring testing data. This facility recently completed a TRE in an attempt to find the source(s) of toxicity. LDEQ does not recommend a Whole Effluent Toxicity (WET) Limit be implemented immediately upon permit reissuance. Rather, LDEQ recommends that a three year compliance schedule be incorporated into LA0032221. The purpose of this compliance schedule is to attain compliance with the WET limit. After this three year period expires, the WET limit stated in Part I of LA0032221 shall become effective.

It is recommended that freshwater chronic biomonitoring (with a WET limit compliance schedule) be an effluent characteristic of Outfall 001 (discharge of 3.8 mgd of treated sanitary wastewater) in LA0032221. The effluent dilution series shall be 31%, 41%, 55%, 73%, and 97% concentrations, with the 97% effluent concentration being defined as the critical biomonitoring dilution and/or WET limit. The testing frequency shall be once per quarter for *Ceriodaphnia dubia* and *Pimephales promelas* for the life of the permit.

This recommendation is in accordance with the LDEQ/OES Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, Water Quality Management Plan Volume 3. Version 6 (April 16, 2008), and the Best Professional Judgment (BPJ) of the reviewer.

Reasonable Potential Analyzer

Type of Testing Fresh Chronic

Facility Name US Dept of the Army/South Fort Polk WWTP

LPDES Permit Number LA0032221

Outfall Number 001

Previous Critical Dilution 97.00

Enter data in yellow shaded cells only. Fifty percent should be entered as 50, not 50%.

Test Data

DMR Period	VERTEBRATE				INVERTEBRATE			
	Lethal NOEC	Sublethal NOEC	Lethal TU	Sublethal TU	Lethal NOEC	Sublethal NOEC	Lethal TU	Sublethal TU
3/1/04-5/31/04 1	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/04-5/31/04 2	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/04-5/31/04 3	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/04-5/31/04 4	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/04-8/31/04 1	97.00	97.00	1.03	1.03	97.00	41.00	1.03	2.44
6/1/04-8/31/04 2	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/04-8/31/04 3	97.00	73.00	1.03	1.03	97.00	30.00	1.03	3.33
6/1/04-8/31/04 4	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
9/1/04-11/30/04 1	97.00	97.00	1.03	1.03	97.00	30.00	1.03	3.33
9/1/04-11/30/04 2	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
9/1/04-11/30/04 3	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
9/1/04-11/30/04 4	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
12/1/04-2/28/05 1	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
12/1/04-2/28/05 2	97.00	30.00	1.03	3.33	97.00	97.00	1.03	1.03
12/1/04-2/28/05 3	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
12/1/04-2/28/05 4	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/05-5/31/05 1	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/05-5/31/05 2	30.00	30.00	3.33	3.33	97.00	97.00	1.03	1.03
3/1/05-5/31/05 3	97.00	97.00	1.03	1.03				
3/1/05-5/31/05 4	97.00	97.00	1.03	1.03				
3/1/05-5/31/05 5	30.00	30.00	3.33	3.33	97.00	97.00	1.03	1.03
3/1/05-5/31/05 6	97.00	97.00	1.03	1.03				
3/1/05-5/31/05 7	97.00	97.00	1.03	1.03				
3/1/05-5/31/05 8	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/05-8/31/05 1	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/05-8/31/05 2	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/05-8/31/05 3	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/05-8/31/05 4	30.00	30.00	3.33	3.33	97.00	73.00	1.03	1.37
9/13/05-9/20/05 4	97.00	97.00	1.03	1.03				
6/1/05-8/31/05 4	97.00	97.00	1.03	1.03				
9/1/05-11/30/05 1	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
9/1/05-11/30/05 2	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
12/1/05-2/28/06 1	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
12/1/05-2/28/06 2	30.00	30.00	3.33	3.33	97.00	97.00	1.03	1.03
12/1/05-2/28/06 3	30.00	30.00	3.33	3.33				
12/1/05-2/28/06 4	30.00	30.00	3.33	3.33	97.00	30.00	1.03	3.33
12/1/05-2/28/06 5	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/06-5/31/06 2	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/06-5/31/06 4	31.00	30.00	3.23	3.33	97.00	97.00	1.03	1.03
6/1/06-8/31/06 4	31.00	30.00	3.23	3.33	97.00	97.00	1.03	1.03
6/1/06-8/31/06 1	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
9/1/06-11/30/06 1	73.00	73.00	1.37	1.37	97.00	97.00	1.03	1.03
1/26/06-2/24/07	31.00	30.00	3.23	3.33	97.00	97.00	1.03	1.03
1/26/06-2/24/07	30.00	30.00	3.33	3.33	97.00	30.00	1.03	3.33
12/1/06-2/28/07 3	31.00	30.00	3.23	3.33	97.00	97.00	1.03	1.03
12/1/06-2/28/07 4	30.00	30.00	3.33	3.33	97.00	30.00	1.03	3.33
2/25/07-5/26/07 3	31.00	31.00	3.23	3.23	97.00	97.00	1.03	1.03
2/25/07-5/26/07 4					97.00	97.00	1.03	1.03
2/25/07-5/26/07 4	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
3/1/07-5/31/07 3	31.00	31.00	3.23	3.23	97.00	97.00	1.03	1.03
3/1/07-5/31/07 4	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/07-8/31/07 3	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
6/1/7-8/31/07 4	97.00	97.00	1.03	1.03	97.00	97.00	1.03	1.03
9/1/07-11/30/07 3					97.00	97.00	1.03	1.03
12/1/07-2/28/08 1	97.00	31.00			97.00	97.00	1.03	1.03
12/1/07-2/28/08 3	97	97	1.03	1.03	97	97	1.03	1.03
3/1/08-5/31/08 1	30	30						
3/1/08-5/31/08 3	97	97	1.03	1.03	97	97	1.03	1.03

Reasonable Potential Analyzer

Facility Name US Dept of the Army/South Fort Polk WWTPLPDES Permit Number LA0032221Outfall Number 001Previous Critical Dilution 97

Enter data in yellow shaded cells only. Fifty percent should be entered as 50, not 50%.

Test Data

DMR Period	VERTEBRATE				INVERTEBRATE			
	Lethal NOEC	Sublethal NOEC	Lethal TU	Sublethal TU	Lethal NOEC	Sublethal NOEC	Lethal TU	Sublethal TU
	30	30	3.33	3.33	97	30	1.03	3.33
Count	56	56			50	50		
Mean	78.732	75.857			97.000	88.700		
Std. Dev.	29.672	30.758			0.000	21.530		
CV	0.4	0.4			0	0.2		

RPMF 1.2 1.2 #N/A 1.11.031 Reasonable Potential Acceptance CriteriaVertebrate Lethal 3.880 Reasonable Potential exists, Permit requires WET monitoring and WET limitVertebrate Sublethal 3.880 Reasonable Potential exists, Permit requires WET monitoring and WET limitInvertebrate Lethal #N/A #N/AInvertebrate Sublethal 3.557 Reasonable Potential exists, Permit requires WET monitoring and WET limit

PRETREATMENT REQUIREMENTS

PRETREATMENT EVALUATION AND RECOMMENDATION

FACILITY NAME: *United States Department of the Army – South Fort Polk WWTP*

PHYSICAL LOCATION: *Fort Polk*

PARISH: *Vernon*

PERMIT #: *LA0032221*

DESIGN FLOW: *3.8 MGD*

ESTIMATED OR EXPECTED TREATED WASTEWATER FLOW: *2.0 MGD*

OTHER POTWs IN SYSTEM: *United States Department of the Army – North Fort Polk WWTP (LA0032239)*

STANDARD LANGUAGE RECOMMENDATION AND JUSTIFICATION:

The LPDES application received by LDEQ on June 4, 2008, states the following wastewater source description, "The South WWTP treats domestic sewage from approximately 2,429 single family housing units, 29 barracks (158 persons/barrack), 190 administrative office buildings, 5 dining facilities, 2 schools (1,000 – 1,600 students), 1 hospital (average 40 beds occupied daily), 4 medical/dental clinics, 24 motor pools, 1 military airfield, 2 gasoline dispensing stations, 3 convenience stores, 1 commissary, and 1 Post Exchange. Fort Polk does not operate any facilities which can be considered significant sources of industrial wastewater discharge as defined by NPDES/LPDES regulations... Twenty-two of the 24 motor pools are equipped with vehicle washing facilities. Motor pool wash racks are still used for occasional vehicle washing... In addition, all motor pool wash racks are equipped with oil/water separators, which pretreat wastewater prior to discharge to the sanitary sewer system."

It is recommended that LDEQ Option 1 Pretreatment Language be included in LPDES Permit LA0032221. This recommendation is in accordance with the Best Professional Judgement (BPJ) of the reviewer.